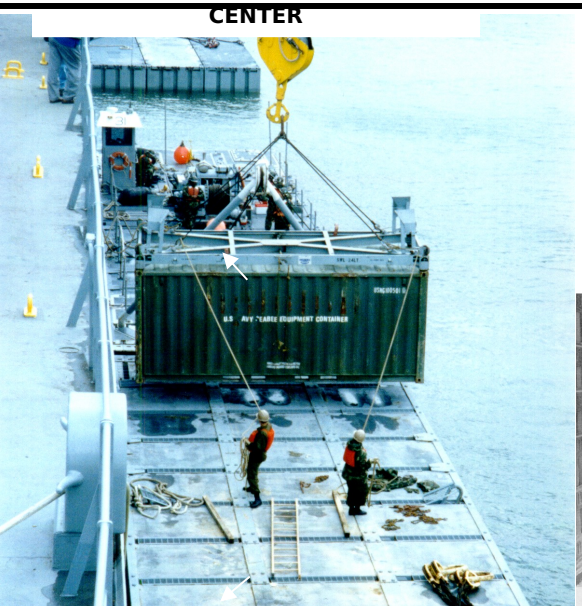
Lighter Deck Impact (LDI)

NAVAL SURFACE WARFARE CENTER



OBJECTIVE

Investigate the severity of container/lighter impact and damage due to relative motion between cargo and

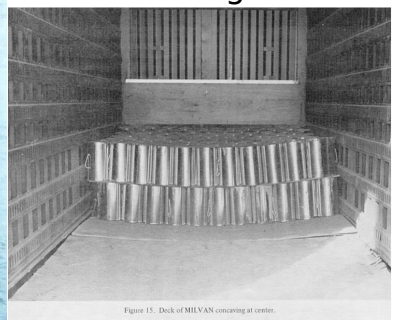


Figure 15. Deck of MILVAN concaving at center.

APPROACH

Review previous efforts. Obtain test and simulation data on relative motions between cargo and lighter deck. Analyze effect of impact velocities on cargo, container and lighter deck. Highlight potential problem areas and propose/evaluate possible solutions to increase cargo throughput.

PAYOFF

Identify problem areas and propose solutions to improve speed, safety and control of container offloading.

Status

Study report with POA&M in progress.

Observations & Issues:

•Relative velocity simulation between cargo and lighter deck, combined with 2 ft/sec from crane hoisting cargo down, ranges up to 6.1 ft/sec or less for 95% of the time at SS-3.

•LCU type lighter deck appears to be tolerant of impacts, with only minor damage at 6 – 8 ft/sec.

•Container and contents begin to show damage at 4 ft/sec impact velocity, becoming more serious at 6 ft/sec and above. No catastrophic failures of containers noted up to 10 ft/sec.

•Report only addresses cargo damage potential, not

Initial Recommendations:

•Continue and finalize implementation of PMC, IRBTS, and the Enhanced Crane Control ATD.

•Investigate infrastructure improvements (i.e. multi-point anchoring of T-ACS to create lee, reduce vessel motion, JRIBS, rigid mooring/fendering using vacuum technology).

•Investigate use of:

- Low Impact Landing Algorithm (LILA).
- Deck matting such as tires or variable density foam.
- Quick Load Release to prevent multiple impacts

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Purpose of all T-ACS related tasks is to improve vertical cargo throughput in sea-state 3.

Goal is to enable existing crane ship throughput minimum of 300 containers per day in sea-state 3

OPERATIONAL CAPABILITY

Current Average	Shortfall
Sea State 3	99%
Sea State 2	44%
Sea State 1	13%